

any time since the industrial accident laws were placed on the statute books in 1913.

The C.M.A. asked for adoption of a "1949 fee schedule" and some of the insurance carriers replied they would pay on the basis of the "1946 fee schedule." The Industrial Accident Commission declined to recognize or approve either of these. Out of such stuff comes a stalemate, a condition which is harmful to all. The Executive Committee of the

Association believes that a "1950 fee schedule" is the solution and that such a schedule, if approved by both insurance carriers and the Association, has every chance to be approved (not adopted) by the Industrial Accident Commission and thus gain the recognition which any such schedule must have in both insurance and medical quarters. It is toward that end that meetings are now going on. We wish the negotiators early and mutual success.

Letters to the Editor . . .

Cancer-Inhibiting Normal Serum Component

Norris and Majnarich¹ noted that the rate of proliferation of *in vitro* cultures of normal bone marrow cells is accelerated by the addition of normal blood serum and inhibited by the serum of cancer patients. In an attempt to isolate the active substances from such serums, the serum proteins were first precipitated by the addition of an equal volume of acetone. The resulting deproteinated serum was evaporated to a small volume under reduced pressure to remove the acetone and then diluted with distilled water to the original serum volume. Test showed that the inhibiting and stimulating factors were present practically quantitatively in the resulting protein-free product.

From this product the active components were removed in large measure by adsorption on activated charcoal ("Norit"). One growth factor was eluted from its Norit carrier with normal NaOH, and a second factor by subsequent elution with ammoniacal acetone. The same method of Norit adsorption and double elution yields growth-stimulating and growth-inhibiting factors from urine.

In a typical test, 0.1 cc. NH_3 -acetone elute from normal urine was added to 2 cc. bone marrow culture containing 4,760 nucleated cells per cu. mm. After seven hours' incubation, the nucleated cell count had increased to 11,800 per cu. mm., an increase of 148 per cent. Control tests without the NH_3 -acetone elute had increased to only 7,920 nucleated cells per cu. mm. or 66 per cent. There was thus more than a 100 per cent acceleration of normal cell

proliferation due to the action of the NH_3 -acetone elute.

A parallel test with NaOH-elute from the same urine showed a final nucleated cell count of only 6,520 per cu. mm., or 29 per cent less than the control count. This is equivalent to nearly 50 per cent retardation of normal cell multiplication. In tests with NaOH-elutes from the urine of certain cancer patients, final cell counts as low as 1,845 per cu. mm. were recorded. This was a reduction of 61 per cent below the initial cell count, suggesting that the NaOH-elute had a lytic as well as an inhibiting action on normal tissue cells.

The tests showed that both normal serum and the serum of cancer patients contain both accelerating and inhibiting substances. The accelerating factor is dominant in normal serum. The inhibiting factor predominates in the serum of cancer patients.

Directly opposite effects were obtained in tests of the same two factors on the proliferation rate of Brown-Pearce tumor cells. While the NaOH-elute inhibits normal cell proliferation, it accelerates proliferation of cancer cells. In the same way NH_3 -elute, which accelerates normal cell proliferation, is an effective inhibitor of the proliferation of cancer cells.

Theoretical and clinical applications of these findings have not yet been reported.

REFERENCE

1. Norris, E. R., and Majnarich, J. J.: Amer. J. Physiol., 152:652; 153:483, 1948. Proc. Soc. Exp. Biol. and Med., 70:229 (Feb.), 1949.

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